Bringing it all together

BTnet UK Internet Access

21CN Customer Service Description

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1 Introduction

BTnet is the market leading internet service, providing uncontended Internet access services via the leading edge 21CN network across the UK, with accesses and bandwidths ranging from 2Mbps to 10Gbps.

If you provide a source of on-line content & applications, or have a requirement to obtain higher levels of throughput, service availability and guarantees, you may benefit from the advantages offered by BTnet circuits, over contended broadband delivered services.

Business to Business (B2B) & Business to Customer (B2C) are the primary function of the Internet in the UK, with Intranet traffic being carried over VPNs. However, there is growing evidence that with the high throughput and availability of Internet services, they are increasingly being used as an alternative business platform, suitable for most applications.

BTnet is delivered using a high speed, highly resilient, core IP platform, which is used to support a range of data services, and is accessible through over 900 access nodes across the UK.

BTnet uses the core IP platform, which is connected to multiple UK ISP peers and, via BT's European Internet backbone, to ISPs & customers around the world. These highly resilient connections are carrying tens of Gigabits of traffic every second.

The BTnet network will continue to be developed to offer the best of breed national and international connectivity that will support you in your quest for business class Internet.

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2 Service Overview

BTnet is available with flexible bandwidth options from 2Mbps to 10Gbps. Once your service is up and running, you will be able to increase or decrease your bandwidth within the bounds of your access capacity (see Annex 2).

Key BTnet Service features are:

- Ethernet fibre delivered services with Total Care (24x7x365).
- Ethernet in the First Mile (EFM) technology delivered services, for bandwidths of 2Mbps to 10Mbps, with Express Care (1 Hour response / 6 Hour fix).
- 2Mbps to 10Gbps of uncontended bandwidths available in flexible increments.
- Flex* capability, giving you the flexibility to vary your bandwidth within your access capacity.
- A range of access speeds are available to deliver the required bandwidth in the following steps 2Mbps to 10Mbps EFM and 10Mbps, 100Mbps, 500Mbps, 1Gbps & 10Gbps fibre.
- Symmetric or asymmetric bandwidth options: The asymmetric option is available on 10Mbps or greater accesses only, with greater outbound (your site to Internet) than inbound bandwidth.
- 1, 3 & 5 year term fixed price contract options with the standard connection fee waived for 3 & 5 year terms.
- A Service Level Agreement, supported with financial compensation if we do not meet stated targets in delivery, availability and latency.
- Resilience options - Failover & Loadbalancing
- Disaster Recovery options are available.
- Bandwidth utilization reports are available on request, via an on-line reporting application.
- Static routed IP addresses (No charge for provision at time of circuit installation).
- Domain name registration and administration (Additional charges may apply).
- DNS (Primary and Secondary name servers).
- Mail services including store and forward (Additional charges may apply)

* Currently, the Flexing modification can only be performed during standard working hours: Monday to Friday (excluding bank holidays) between 0800 and 1600.

3 Suitability

BTnet Internet access services are designed for use by ISPs, OLOs, Corporate, Government and Business customers in the UK. If you require full flexibility from your Internet access service, with scalability of bandwidth to support all of your future business requirements, backed by competitive SLA's, supported by a range of resilience options, then you should choose BTnet.

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4 Service Options

BTnet is delivered over a range of accesses and allows you to specify the bandwidth required within the capacity of each access. The service can be delivered with or without a router (CPE) at the customer site.

The service may be provided with symmetric or asymmetric bandwidth (if the inbound bandwidth is 10Mbps or greater). Symmetric bandwidth is the standard configuration for your modern business platform and satisfies the requirements of time critical applications such as voice communications, conferencing and collaboration. With asymmetric configuration the outbound bandwidth (from your site to the Internet) is greater than the inbound bandwidth. This asymmetric service is ideal if you are a content or application provider, sending more data to the Internet than you receive, and offers cost benefits accordingly. Both configurations have uncontended bandwidth as standard.

BTnet allows you to flex your bandwidth within your access capacity, with a target lead-time of only 2 days from the time the request is accepted by BT[1]. Please be aware of the following

- Flexing that requires an access change has a lead-time and charges the same as that of a new provision.
- There is no limit to the number of flex ups (increases in bandwidth)
- The customer must maintain a flexed bandwidth for a minimum of 5 days before flexing down (decreasing bandwidth).
- Currently, the flexing modification can only be performed during standard working hours: Monday to Friday (excluding bank holidays) between 0800 and 1600.
- Please refer to Terms and Conditions for specific terms related to the flexing of the BTnet service.
- To flex your bandwidth, please contact your BT Account Manager.

4.1 Availability

BTnet offers an SLA against leadtimes, latency and availability with compensation when targets are not met.

Latency will be determined by BT calculating the average of round-trip transmission measurements taken in ten minute intervals during a calendar month. The results will be posted via the BTnet external website (www.bt.net).

The Latency Guarantees applicable to the UK Core Network Connection and to the Transatlantic Network Connection are as set out below;

[1] For large bandwidth requests BTnet team will check and confirm lead time for the flex to take place.

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The UK Core Network Connection:
The Latency Guarantee is an average round-trip transmission time of 20 milliseconds or less between BT selected core PoPs in the BT Network.

The Transatlantic Network Connection:
The Latency Guarantee is an average round-trip transmission time of 95 milliseconds or less between designated transit routers at each end of the transatlantic link.

BTnet availability SLA targets:

Access Speed	SLA %
2 - 10Mbps EFM	99.95
10Mbps to 10Gbps Ethernet	100.00

BTnet also offers service availability compensation to our customers. Full details are detailed in the BTnet SLA which can be obtained from your account manager.

4.2 Resilience Options

BTnet offers two levels of resilience. Both of these utilise a secondaccess, with the following configurations available:

4.2.1 Failover

Utilising a redundant clone of your main access, with diverse routing where available, Failover provides a continuation of service in the event of main access circuit failure, with all traffic routed over the activated second circuit.

4.2.2 Loadbalancing

By providing a second active access, with diverse routing where available, Loadbalancing ensures continuity of service in the event of access failure on either access, while providing up to double the bandwidth requirement during normal service.

4.3 IP Addresses

You will require public registered IP addresses to enable the routing of data traffic to specific devices and locations via your BTnet service. IP addresses can be issued to you by BT, with no additional charge at the time of ordering your internet service, or, if you have them, your own Provider independent (PI) addresses can be used. BT will use RIPE guidelines to ensure you are allocated enough IP addresses for your needs. It is important to include your IP needs as part of your service considerations, as the RIPE guidelines require you to justify the address space requested.

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BTnet can only route IP addresses provided by BT or your own PI addresses. IP Addresses stay with the ISP who issued them, so if you are moving from another ISP, you will need to hand back your IP addresses and take new ones from BT. Similarly, IP addresses issued by BT, unless they are PI addresses, are not transferable to another ISP's service. If your own PI addresses have been previously routed by another ISP, you will need to ensure their network stops advertising your addresses when you move to BTnet.

RIPE (http://www.ripe.net/) control the issuing of public IP addresses and mostly issue via ISPs who allocate to their customers from their Provider Allocated (PA) address space. But, under certain circumstances, RIPE issue addresses from their Provider Independent (PI) address space directly to customers. To enable better control of PI Resources (PIR), RIPE has put in place mechanisms which requires BT, as your internet service provider, to include the following conditions in our contracts if you take PI Resources:-

- None of the PIR may be sub-assigned to a third party
- Registration fees must be paid by the Customer to BT for the PIR
- The PIR will return by default to the RIPE Network Coordinating Centre if the customer cannot be contacted and/or any registration fees are not paid to BT
- The use of PIR is subject to RIPE policies as published on the RIPE web site and which may be amended from time to time.

4.4 Multi-homing using BGP4

BTnet supports your use of BGP4 to set up multi-homing to a second service provider if required. If you wish to take service from BTnet and another ISP connected to the same equipment, you will need to use Border Gateway Protocol Number 4 (BGP4) on your router. To do this, you will need to apply to RIPE for an Autonomous System number (AS number). The AS number identifies you as a unique network, independent of any ISP's network, and allows two or more ISPs to route internet traffic to and from you. Your BT Account Manager will assist you in securing an AS number.

In order to use BGP4, you will need to use your own RIPE registered IP addresses (Provider Independent or PI) rather than the BTnet or other ISP's issued addresses. Addresses issued by an ISP (Provider allocated) will form part of your PA address space and will not be routable via BGP4. BTnet will support your BGP4 activities, although Failover, Loadbalancing and multi homing will be mutually exclusive services. These can not in any way be combined to allow you to run BGP4 over the Failover or Loadbalancing BTnet services, when they become available.

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4.5 Disaster Recovery

4.5.1 Disaster Recovery Overview

By applying a Disaster Recovery solution to your BTnet service, you will benefit from the ability to quickly reconfigure your IP services from one site to another in the event of a disaster. You will have to quote a security password, which requires validation before a pre-agreed plan will be evoked. If you require the additional security of BTnet Disaster Recovery, you will have a customised Disaster Recovery Plan tailored to meet your needs. If, after the plan has been activated, it seems that the re-routing of traffic will be long term, it may be recommended that the re-routing be made permanent.

4.5.2 Disaster Recovery Delivery

If you require a Disaster Recovery plan, you must complete a Customer Requirement Form (CRF) and provide a diagram detailing your requirements. The completed CRF and diagrams will then be passed to the BTnet design team, who will draw up the plan in consultation with you.

To invoke the plan you must contact BTnet support and give the appropriate security details, these will be agreed between you and BTnet per plan.
To cancel activation of the plan you must contact BTnet support and, using the cancel password for the plan, instruct them to restore the traffic to normal routing. In both cases the target is 2 hours and BTnet support will advise you of completion and assist with any verification required.

For activation Tel: 0800 699879 (Option 2)

Any changes to your network that may affect the service in regard to the disaster recovery plan (such as re-allocation of IP addresses) must be advised to BTnet so that a revision can be made to the plan. It is your responsibility to advise BTnet if changes have been made that will affect the plan.

BTnet Disaster Recovery services are not included in any Service Level Agreement

4.6 Application services

4.6.1 Domain Name Service

Domain Name Service (DNS) is a distributed hierarchical system for resolving host names to IP addresses. If you are connected to the BTnet network and have registered a domain name, you must have multiple name servers for the domain: a primary server and at least one secondary server for back up purposes.
Domain names are subject to separate terms and conditions set by the appropriate registry.

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4.6.1.1 Primary Domain Name Service (DNS)

The primary domain name server has the authority for the whole domain. Each domain must have a primary and at least one secondary name server.

- Up to 10 primary DNS names are included and hosted free of charge. Additional names can be added as a chargeable option.
- BTnet can register DNS on your behalf (This is a chargeable option).
- Primary DNS is available for any domain that you own.
- If you are moving to BTnet from another supplier you must inform the local registration authority of the change to your existing Primary DNS or have your current supplier do that for you. The registration authority will only accept changes from you or the existing supplier.

4.6.1.2 Secondary Domain Name Service (DNS)

BTnet provides a secondary domain name service for name and address resolution. This is reliant upon you having already obtained a primary DNS, which will transfer details to the BTnet secondary DNS. Guidelines for this service are as follows:

- Secondary DNS for up to 250 domains per customer are included as standard. More domains can be included as a chargeable option if required.
- Changes to the DNS Primary server that may affect zone transfers must be notified to BT through the BTnet DNS team by email: dns.registration@bt.com

4.6.1.3 DNS Registration Charging

BTnet provides a registration service for your domain names. We will register your requested domain name with the appropriate registration authority, subject to the availability of the requested name. BT will apply a charge for this service.

BT will provide support for DNS changes in standard working hours. Changes made out of hours will incur a charge. Requests for support must go through your BT Account Manager. DNS activities are not covered by any Service Level Agreements.

4.6.2 Mail

Email, along with most network applications, is based on client/server architecture. BTnet's email system is based on the Simple Mail Transfer Protocol (SMTP). SMTP allows the transmission of messages from one server to another. The objective of SMTP is to transfer mail reliably and efficiently.

BTnet has multiple mail servers and offers (if you have your own mail server) a store and forward mail service. This can be used when your mail server does not wish to establish SMTP sessions with remote mail servers on the Internet.

If you are managing your own mail servers, you must ensure they are NOT configured to allow open mail relay. Failure to enforce this could lead to BTnet blocking all of your mail as open relays are used for SPAM.

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Alternatively, as a chargeable option, dedicated mail boxes can be set up on a BTnet POP3 Mail Server. For each mailbox you will receive a username and password. In order to communicate with the BTnet POP3 Mail Server, each end user requires a personal mail client.

5 Customer Premises Equipment (CPE)

CPE is provided as standard, as part of the BTnet service. The BTnet CPE provides isolation between the network and any of your own equipment and defines the BTnet service boundary.

BT is solely responsible for the configuration and maintenance of the CPE provided with BTnet.

Limited SNMP read only access to the CPE, to view utilization and alarm statistics, is available as a chargeable option if your service meets the following criteria:

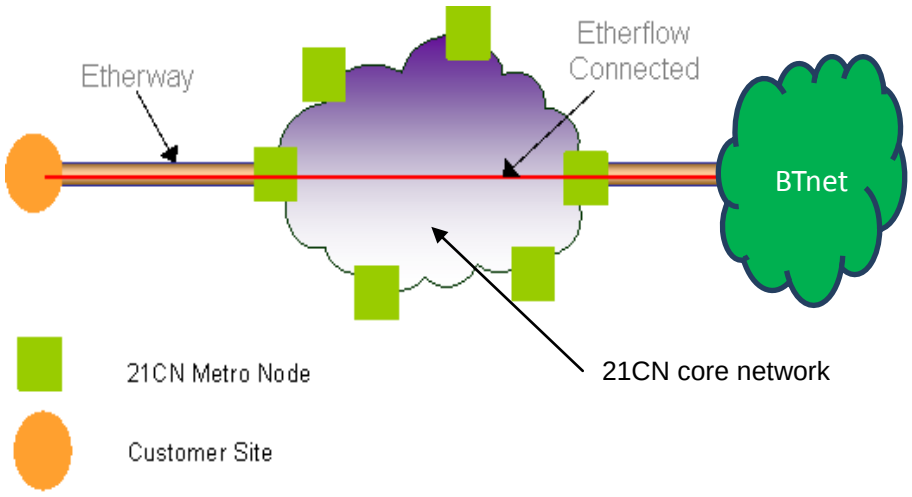
- Have 1 or more circuits totaling 10Mbps of bandwidth or above.
- Suitable network management systems in place.

Full details of the type of CPE provided are available in Annex 3.

6 Access Network

BTnet uses BT's 21CN connection-oriented Ethernet VPN service ("BT Etherflow") to connect customers to the BTnet core network.

BT Etherflow consists of two components which form the building blocks of the service. These are Etherways and Etherflows.



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6.1 Etherway

Etherways are the circuits, or accesses that provide connectivity from a customer's site to a Point of Presence (PoP) on BT's 21C Network.

The EFM services (using Etherway Copper) use equipment to provide the Ethernet access over Openreach LLU copper loops, providing access at speeds from 2Mbps up to 10Mbps over bonded copper services.

Etherways can be resilient or standard. These will support the BTnet Resilient service options (Loadbalancing or Failover).

6.2 Etherflow connected

An Etherflow Virtual Connection is the logical connection that provides the data transmission path from the customer site to the BTnet core network.

BTnet uses Etherflow Virtual Connections that utilize the Premium class of service which is uncontended and is optimised to support delay-sensitive business voice and data applications where low end-to-end delay, with minimal packet loss is a requirement. All the traffic within the Service has equal priority and the full bandwidth rate can be utilised.

6.3 Customer interface presentation

6.3.1 Etherway Copper Delivery

Ethernet in the First Mile is an approved Ethernet Standard, IEEE 802.3ah, that supports Ethernet access either using single to multiple voice grade copper pairs.

Physical access to the customer site is via multiple voice grade copper pairs presented as a RJ45 Ethernet connection from the Hataras 408 NTE equipment (for wires only) or via the RJ45 Ethernet connection on the BTnet supplied CPE.

6.3.2 Etherway Fibre Delivery

BTnet fibre delivered service is available over Etherway access speeds of 10Mbps, 100Mbps, 500Mbps and 1Gbps.

Physical access to the customer site is via optical fibre, terminated on Optical Network Terminating Equipment (NTE) at the customer site. Additionally, if the BTnet managed CPE router option is taken, then the customer interface presentation is as follows:

Service	Interface
10Mbps	10BaseT interface.
100Mbps	100BaseT interface.
500Mbps	1000Base-SX or 1000Base-LX interface.
1Gbps	1000Base-SX or 1000Base-LX interface.

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7 Service Level Agreement (SLA)

BTnet is covered by a Service Level Agreement, which will provide guarantees and targets in three areas; Installation, Availability and Network Latency. This enables BTnet to give you a commitment to a high standard of network performance.

Details of the SLA are available from your BT Account Manager.

8 Pre Order Support

Your BT Account Manager will provide help if you require more information. This includes technical, pricing and product information for moves, service additions, cessation, upgrades and new services.

9 Customer Service

BTnet provides a competitive SLA and aim to clear faults within 5 working hours of the fault being reported for BT Fibre delivered services and 24 hours for EFM delivered services. A single point of contact is available to you for fault reporting.

To report a fault Tel: 0808 100 2440 (BT Retail customers)
Tel: 08000 456 5909 (BT GS/Wholesale Customers)

BTnet provides comprehensive arrangements for:

- order entry & provision management
- fault management
- billing

You can request on-line bandwidth utilization reports, covering

- Previous 24hrs
- Previous week
- Previous month
- Preceding months

For further information please contact your BT Account Manager, or email CNH.Flex@bt.com

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10 Service Delivery

10.1 Service Delivery Overview

An appointed service desk will centrally manage the provision of a service purchased from BTnet. Delivery support will be available Monday to Friday between 8am and 5pm, excluding public holidays.

The service desk will co-ordinate and own the provision of your new order and progress it appropriately. A number of functions are carried out which includes project management (where appropriate), service design, commissioning and acceptance testing.

A project coordinator or project manager will be allocated to you and you will receive an event plan which explains the provisioning process and key stages.

Once the order validation and any necessary survey activity are complete, you will receive confirmation of acceptance of the order, target delivery dates, order reference number, and notification of any additional costs. You will be requested to verify your acceptance of any additional costs as a prerequisite to delivery.

The service desk will continue to manage delivery of the order through to completion and will provide you with regular progress updates.

A service pack will also be provided containing a guide explaining the service features. It will also include advice on how to contact the relevant service desk in the event of a service or invoicing problem or other enquiry.

Once the order is completed, the service desk will ensure that it has been delivered to your complete satisfaction. You may be requested to provide a satisfaction assessment of the overall support provided. Billing will only commence once the service has been delivered and accepted by the customer.

10.2 Additions, Modifications & Cessation

The initial request for additions, modifications and cessation may be made directly via your BT Account Manager. All activities will be coordinated in a similar way as previously described for new service delivery.

In the case of a cessation order, the service will be suspended and a final invoice issued prior to actual decommissioning of the physical BT elements of the service.

A cease order must be supported by an email or faxed letter on your headed note paper, to your BT Account Manager.

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10.3 Lead Times

Service over 21CN	Target Service lead-time
2Mbps - 10Mbps EFM	30 working days
10Mbps -10Gbps Ethernet Fibre	70 working days

Note: 'Working days' refers to standard working hours, Monday to Friday, excluding public holidays. All lead-times are subject to site survey and line plant availability at the site.

11 Termination of Service

Termination of service details are covered by the Service Level Agreement and Terms and Conditions.

12 Service Management and Assurance

12.1 DoS Mitigation

BTnet proactively monitors traffic flowing into and out of its core network infrastructure in order to detect traffic anomalies and Denial of Service (DoS) attacks, resolve attacks and determine which network connections the attacks are coming from.

You have the option of enhancing the security on your BTnet internet access by adding proactive Distributed Denial of Service (DDoS) mitigation as a chargeable option. BT's proactive DDoS mitigation service mitigates attacks by monitoring the internet traffic for DDoS attacks, DoS floods, Protocol Misuse, Worms and behaviour anomaly based attacks. The DoS protection platform profiles normal behaviour and identifies attacks based on anomalous behaviour patterns. It allows authorised traffic profiles as agreed with you to continue unaffected by the attack, but filters out the attack traffic.

You should contact your BT Account Manager if you require further information on proactive Distributed Denial of Service (DDoS) mitigation for your BTnet service.

12.2 Cleanfeed

BTnet services have Cleanfeed as a standard feature; Cleanfeed blocks access to internet sites included on the Internet Watch Foundation (IWF) list. The system uses a filter to capture any attempts to reach URLs / IP addresses on the IWF black-listed websites list only and then black holes the traffic.

The system is designed to cater only for port 80 HTTP traffic through a special 2 stage filter that compares requests against known black-listed websites. All other

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traffic bypasses the filtering system. Attempts to access a blacklisted site will receive an "**HTTP Error 404 Website not Found**" message

BT plays no part in the construction or identification of sites contained within the IWF list. Nor does it add any other categories or items for consumer blacklisting. BTnet does not hold any records of access to sites on the IWF list. All traffic to IWF listed sites is black holed if you have not opted out of Cleanfeed.

If you would like to opt out, please contact your BT Account Manager.

Please note, any queries on the sites listed must be made directly with the IWF and not BT. Please see the IWF site for details (http://www.iwf.org.uk/) of the process to unblock incorrectly identified URLs sites.

13 Pricing

For a full explanation of BTnet prices, including provision, rental and added service charges, please contact your BT Account Manager.

14 Billing

You will be charged the relevant annual rental for the services you have taken. This will be billed quarterly in advance and your first bill will also include any applicable connection charge.

All bills will include a contact number for billing enquiries.

Billing will commence from the time that the BTnet service is delivered and accepted by the customer.

For billing enquires Tel: 0800 679320.

Email: btnet.ipservices@bt.com

15 Other Information

Further documentation is available from your BT Account Manager. This includes:

- BTnet Service Level Agreement.
- Terms and conditions.
- BTnet Data Sheet (a comprehensive summery of BTnets key benefits and features).
- DDoS Data Sheet.
- Utilisation Report User Manual.

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16 Abbreviations

The following terms and abbreviations in this document are defined and used as follows:

CPE	Customer Premise Equipment
CRF	Customer Requirement Form
DNS	Domain Name Service
DOS	Denial of Service
DDOS or DDoS	Distributed Denial of Service
DR	Disaster Recovery
EAD	Ethernet Access Direct (access circuit type)
EFM	“Ethernet in the First Mile” Technology
IP	Internet Protocol
ISP	Internet Service Provider
IWF	Internet Watch Foundation
LE	Local Exchange
NTE	Network Terminating Equipment
PA	Provider Allocated
PIR	Provider Independent Resource
POP	Point of Presence – the exchange location where your access circuit connects into the BTnet service.
OLO	Other Licensed Operators
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
VLAN	Virtual Local Access network
WES	Wholesale Extension Service (access circuit type)

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Annexes

Annex 1: BTnet Features Summary

Feature	Details
Access speeds	Ethernet in the first mile (EFM): 2, 3, 4, 5, 6, 7, 8, 9, 10Mbps, Ethernet Fibre: 10, 100, 500Mbps, 1Gbps & 10Gbps
Support	Total Care: 24/7/365 on Fibre delivered services. Express Care: 1hr response, 6 hr fix on EFM Ethernet services.
Service Contention	BTnet is an uncontended service
Service Management CPE	BTnet is supplied with CPE by default, but can be provided without CPE (wires only) if requested.
Flexibility	You may increase or decrease bandwidth within access capacity.
Resilience options	Failover and Loadbalancing
Static routed IP addresses	Are provided in line with RIPE guide lines.
Primary DNS	Up to 10 domain names free, subsequent names are chargeable.
Secondary DNS	Up to 250 domain names free, subsequent names are chargeable
POP3 Mail	POP3 mail is a chargeable option
Domain name registration	Domain name registration options are available. This incurs an additional charge.
Customer reports	Available on request via your BT Account Manager
Term	1, 3 & 5 years contracts
Installation SLA	Please refer to appropriate SLA documentation
Availability SLA	Please refer to appropriate SLA documentation
UK-US Latency	95milliseconds Round Trip Delay
UK Latency	20milliseconds Round Trip Delay
Proactive DDOS Mitigation	Is available as a chargeable optional security enhancement
Cleanfeed	Is available as standard, with option to opt-out

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Annex 2: BTnet access and Bandwidths Available

Access	Bandwidth available	LAN Interface	Access Interface	Access protection
EFM 2Mbps - 10Mbps	2Mbps to 10Mbps in 1Mbps increments Subject to access class speed	10BaseT	2M G.703	Unprotected
10Mbps	2Mbps to 10Mbps in 1Mbps increments	100BaseT	10BaseT	Unprotected
100Mbps	2Mbps to 100Mbps in 1Mbps increments	100BaseT	100BaseT	Unprotected
500Mbps	10Mbps – 500Mbps 10Mbps increments (GigE interface)	1000BaseT 1000Base-SX (copper and fibre options available)	1000 BASE-SX	Unprotected
1Gbps	2Mbps – 1Gbps >100Mb =10Mbps increments	1000BaseT 1000Base-SX (copper and fibre options available)	1000 BASE-SX	Unprotected
10Gbps	100Mbps– 1Gbit/s = 10Mbps increments 110Mbps – 10Gbps =100Mbps increments	10GBase-LR (10 Gigabit Ethernet LAN-PHY)	10GBase-LR (10 Gigabit Ethernet LAN-PHY)	Unprotected

Access Presentation without CPE

500Mbps & GigE services

The GigE is presented via a port on the Openreach Access NTE. The NTE has a 1000Base-SX presentation via a Multimode dual SC optical connector for the WES product or a Multimode dual LC optical connector for EAD.

The optical fibre patch cords to be used on your side of the LES 1000 NTE must be 850nm wavelength, 62.5/125 or 50/125 micron multimode fibre with LC or SC connectors as determined by the Openreach Access product used.

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10GigE Services

The 10GigE is presented via a port on the WES10000 NTE.
The NTE customer interface is 10GBase-LR optical presentation via a pair of SC/PC type fibre interface connectors (transmit & receive).
The optical fibre patch cords to be used on the customer side of the WES10000 NTE must be 1310nm wavelength, 9/125 micron Single-mode fibre with simplex SC connectors.

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Annex 3: Typical CPE Types and Specification

Access Speed	Service Variant**	Router Supplied (Cisco)*
10Mbps	None	1841
100Mbps	None	7204VXR or 3825 or 2921
500Mbps / 1Gbps	None	7206VXR or 7201
10Gbps	None	Cisco Catalyst6503-E
10Mbps	BGP	2811
100Mbps	BGP	7204VXR or 3825 or 2921
500/ 1Gbps	BGP	7206VXR or 7201
10Gbps	None	Cisco Catalyst6503-E

*Note: This is typical CPE that may be supplied with your service, but may be subject to alteration by BT.

**Service Variant "None" = Standard (ie no resilience)

Router Model	Cisco Part No.	Weight	Dimensions(H* W*D)	19" Rack Mountable	Power Usage
Cisco 1841	Cisco1841	(max) 6.2 lb (2.8 kg)	13.5 x 10.8 in. (343 x 274 mm) Height without rubber feet: 1.73 in (439mm) Height with rubber feet: 1.87 in (475mm)	No	50 Watts
Cisco 2811	n/a	(max) 14 lbs. (6.4Kg)	1.75 x 17.25 x 16.4 in. (44.5 x 438.2 x 416.6 mm)	Yes (1 RU high)	170 Watts
Cisco 7204VXR	n/a	(max) 50 lbs. (22.7Kg)	5.25 x 16.8 x 17 in. (133.4 x 426.7 x 432 mm)	Yes (3 RU high)	370 Watts
Cisco 3825	n/a	(min) 23 lbs. (10.45Kg)	3.5 x 17.1 x 14.7 in (88.9 x 434.3 x 373.4 mm)	Yes (2 RU high)	300 Watts
Cisco 7201	CISCO7201	(max) 16.5 lbs. (7.48Kg)	1.75 x 19 x 16.9 in. (444 x 482.6 x 429.3 mm)	Yes (1 RU high)	150 Watts
Cisco 7206VXR	7206VXR/NPE-G2	(max) 50 lbs. (22.7Kg)	5.25 x 16.8 x 17 in. (133.4 x 426.7 x 432 mm)	Yes (3 RU high)	370 Watts
CISCO WS-C6503-E	WS-C6503-E-FAN	85.4 lb (38.7 kg)	7 x 17.37 x 21.75 in. (17.78 x 44.12 x 55.25 cm)	Yes (4 RU)	1400W per supply. (dual supplies fitted)
CISCO 2921	CISCO2921/K9	29 lb (13.2 kg.)	3.5 x 17.25 x 18.5 in. (88.9 x 438.2 x 469.9 mm)	Yes (2 RU high)	320 Watts

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